



**Line Report: Proposed Baseline and Setback Line
Myrtle Beach
October 6, 2017**

Background

South Carolina Code of Laws §48-39-280, as amended, requires the Department of Health and Environmental Control's Office of Ocean and Coastal Resource Management (OCRM or Department) to establish and periodically review the position of the two lines of beachfront jurisdiction (the baseline and the setback line) once every seven to ten years. For all oceanfront land that is developed or potentially could be developed, the average annual shoreline change rate, also known as the average long-term erosion rate, is also reviewed during this timeframe. The purpose of these jurisdictional lines is to implement §48-39-280(A), which states:

“A forty-year policy of retreat from the shoreline is established. The department must implement this policy and utilize the best available scientific and historical data in the implementation. The department must establish a baseline which parallels the shoreline for each standard erosion zone and each inlet erosion zone. Subject to Section 48-39-290(D), the baseline established pursuant to this section must not move seaward from its position on December 31, 2017.”

The baseline is the more seaward of the two jurisdictional lines. Seaward of the baseline, permitted activities are limited to wooden walkways, small wooden decks, fishing piers, golf courses, normal landscaping, groins, activities authorized by emergency orders, beach renourishment projects, and structures authorized by a special permit. The setback line is the landward line of beachfront jurisdiction. Between the baseline and setback line, the Department exercises regulatory permitting authority for such activities as habitable structures and associated infrastructure, decks, gazebos, other public access structures, and sand dune management. Seaward of the setback line, construction of new shore-parallel erosion control structures (i.e. seawalls, revetments or bulkheads) is prohibited. However, existing erosion control structures may be maintained or repaired with prior authorization by the Department.¹

As part of the process of delineating these jurisdictional lines, the Department has collected beach survey data statewide since 1988 at monitoring stations that are typically spaced 2,000 feet apart. Sections of the coast that are not likely to be developed, such as Cape Romain National Wildlife Refuge, are not surveyed. Surveys begin landward of the primary oceanfront sand dune, if one exists, and extend down the beach and offshore. In addition to this beach erosion monitoring data, the Department utilizes recent dune field topographic data such as Light Detection and Ranging (LIDAR), elevation measurements collected with a survey-grade GPS unit, vegetation measurements collected with a mapping-grade GPS unit, current and historical aerial photographs dating back at least 40 years that show the shoreline location, and previous shoreline change analysis data or reports. These data were viewed and analyzed using ESRI's Geographic Information System (GIS) software.

¹ S.C. Code Ann. §48-39-290(A).

Process for Establishing the Baseline Position

To establish the baseline position, the shoreline must first be classified as an inlet zone or a standard zone. Areas that are close to inlets with non-parallel offshore bathymetric contours and non-parallel historical shoreline positions are classified as inlet zones, while all other areas are classified as standard zones. Inlet zone classifications are further refined as either unstabilized, or stabilized by jetties, groins, or seawalls.

In stabilized inlet zones and standard zones, the baseline is located at the crest of the primary oceanfront sand dune using beach survey data or dune field topographic data such as LIDAR. The primary oceanfront sand dune is defined as a dune with a minimum height of 3 feet, as measured vertically from the crest to the toe of the dune. This dune must also form a continuous line for 500 shore parallel feet.² If the shoreline has been altered naturally or artificially by the construction of erosion control devices, groins, or other man-made alterations, the baseline must be established where the crest of the primary oceanfront sand dune would be located if the shoreline had not been altered.³

To calculate a dune crest position at an armored⁴ location, the volume of sand on the beach seaward of the erosion control structure is determined from survey data and then compared to the volume of sand from a nearby unarmored reference profile that displays a representative sand dune. The reference profile is overlaid on the armored profile in such a way that the measured sand volumes match, and then the dune crest position can be transferred from the reference profile to the armored profile. This calculated dune crest position then becomes the baseline.

In unstabilized inlet zones, the baseline is established at the most landward shoreline position at any time during the past 40 years, unless the best available scientific and historical data of the inlet and adjacent beaches indicate that the shoreline is unlikely to return to its former position. This baseline position is established by analyzing shorelines created from historical aerial photographs or shoreline data collected in the field, and identifying the most landward shoreline position.⁵

Process for Establishing the Setback Line Position

The setback line position is dependent on the baseline position and the average annual shoreline change rate, also known as the average long-term erosion rate. The shoreline change rate is calculated using available historical shoreline data and GIS software. The setback line is established landward of the baseline a distance which is 40 times the average annual shoreline change rate or not less than 20 feet.⁶

During this line review, the shoreline change rate calculation was performed using AMBUR (Analyzing Moving Boundaries using R), a tool available through the R-forge statistical environment. Shoreline change analysis was performed every 200 feet. Once the shoreline change rates were calculated, they were analyzed and grouped using the ESRI ArcGIS spatial statistics tool called 'Grouping'. The values within each group were averaged to obtain an

² S.C. Code Regs. 30-1(D)(43).

³ S.C. Code Ann. §48-39-280(A)(1).

⁴ S.C. Code Ann. §48-39-250(5).

⁵ S.C. Code Ann. §48-39-280(A)(2).

⁶ S.C. Code Ann. §48-39-280(B).

annual shoreline change rate. This rate was multiplied by 40 to generate the setback distance from the baseline.

Myrtle Beach Baseline

Myrtle Beach is a 10-mile length of shoreline in Horry County from just north of Springmaid Pier and OCRM Monument 5280 to Singleton Swash.

Myrtle Beach Standard Zone

The entire Myrtle Beach shoreline is classified as a standard zone. Several erosion control structures are present, and the baseline position was calculated using the volume calculation method. Using armored transects at MB21 (2511 S Ocean Boulevard), MB22 (2311 S Ocean Boulevard), MB23 (2201 S Ocean Boulevard), MB24 (1501 S Ocean Boulevard), MB25 (1301 S Ocean Boulevard), MB26 (901 S Ocean Boulevard), MB28 (301 S Ocean Boulevard), MB33 (5400 N Ocean Boulevard), MB34 (6000 N Ocean Boulevard), and a reference, unarmored transect at MB32 (4406 N Ocean Boulevard), calculations were performed to determine, if the shoreline were not armored, the location of the primary dune crest. At MB21, the primary dune crest would be located 7 feet landward of the erosion control structure. At MB22, the primary dune crest would be located 24 feet landward of the erosion control structure. At MB23, the primary dune crest would be located 33 feet landward of the erosion control structure. At MB24, the primary dune crest would be located 24 feet landward of the erosion control structure. At MB25, the primary dune crest would be located 49 feet landward of the erosion control structure. At MB26, the primary dune crest would be located 15 feet landward of the erosion control structure. At MB28, the primary dune crest would be located 80 feet landward of the erosion control structure. Between 5400E and MB33, the baseline follows LiDAR or remains on the 2008 baseline location. At MB33, the primary dune crest would be located 42 feet landward of the erosion control structure. At MB34, the primary dune crest would be located 42 feet landward of the erosion control structure. The erosion control structures were buffered by these distances to establish the baseline. From MB34 to Singleton Swash the baseline remains on the 2008 baseline location.

Beach	Profile (Reference or Armored)	Monument # or Other ID	Upper Contour (ft)	Lower Contour (ft)	Calculated Volume (cy/ft)	X-Position to Match Volumes (ft)	X-Position of Dune Crest (ft)	X-Position Difference (ft) = landward offset from wall
Myrtle Beach	Armored	MB20	10.433	-5.108	121.665			-19
Myrtle Beach	Reference	MB32	8.334	-5.157	122.29	72.76	92.261	
Myrtle Beach	Armored	MB21	11.156	-4.447	95.981			7
Myrtle Beach	Reference	MB32	10.004	-4.473	96.48	99.21	92.261	
Myrtle Beach	Armored	MB22	13.761	-5.145	96.18			24
Myrtle Beach	Reference	MB32	8.223	-5.157	97.802	116.346	92.261	
Myrtle Beach	Armored	MB23	10.772	-4.783	86.886			33
Myrtle Beach	Reference	MB32	8.155	-4.788	87.835	125.76	92.261	
Myrtle Beach	Armored	MB24	10.992	-5.107	96.74			24
Myrtle Beach	Reference	MB32	8.223	-5.157	97.802	116.346	92.261	

Beach	Profile (Reference or Armored)	Monument # or Other ID	Upper Contour (ft)	Lower Contour (ft)	Calculated Volume (cy/ft)	X-Position to Match Volumes (ft)	X-Position of Dune Crest (ft)	X-Position Difference (ft) = landward offset from wall
Myrtle Beach	Armored	MB25	11.365	-4.788	81.165			49
Myrtle Beach	Reference	MB32	10.469	-4.788	79.925	141.585	92.261	
Myrtle Beach	Armored	MB26	9.805	-5.157	102.608			15
Myrtle Beach	Reference	MB32	9.144	-5.157	102.234	107.7	92.261	
Myrtle Beach	Armored	MB27	11.525	-4.79	108.763			-4
Myrtle Beach	Reference	MB32	12.362	-4.788	107.844	88.631	92.261	
Myrtle Beach	Armored	MB28	13.419	-4.729	61.244			81
Myrtle Beach	Reference	MB32	8.181	-4.788	61.498	173.05	92.261	
Myrtle Beach	Armored*	MB29						
Myrtle Beach	Armored	MB30	12.603	-4.786	113.262			-16
Myrtle Beach	Reference	MB32	8.278	-4.788	114.597	76.186	92.261	
Myrtle Beach	Armored	MB31	13.93	-4.872	119.203			-28
Myrtle Beach	Reference	MB32	8.882	-4.788	120.4	64.412	92.261	
Myrtle Beach	Armored	MB33	11.014	-4.57	77.459			43
Myrtle Beach	Reference	MB32	8.286	-4.473	79.122	134.933	92.261	
Myrtle Beach	Armored	MB34	12.116	-4.817	83.05			43
Myrtle Beach	Reference	MB32	8.286	-4.788	83.42	134.933	92.261	
Myrtle Beach	Armored	MB35	11.071	-4.832	109.423			-4
Myrtle Beach	Reference	MB32	12.362	-4.788	107.844	88.631	92.261	

Myrtle Beach Setback Line

The following table identifies average annual shoreline change rates, from south to north.

Location Description	Shoreline Change Rate (ft/year) *	Multiplier	Setback Distance (ft)
From Springmaid Pier to the north end of N. Ocean Boulevard	^	N/A	20
Transition north for 149 feet, then north for 220 feet to Singleton Swash, then transition north for 108 feet	-0.7394	40	30

* A negative number indicates erosion.

^ When this symbol is present, it indicates that the minimum setback is required. The shoreline change rate in these areas is between -0.5 and +31.0 ft/year.

Final Product

Once the location of these proposed new beachfront jurisdictional lines is determined, this "line report" is prepared documenting how the new line positions were established. The proposed lines are then released for a 30-day public comment period, and a public hearing is held for public review and comment on the proposed line positions. The proposed lines are also made available for public review on the South Carolina Beachfront Jurisdiction viewer (<https://gis.dhec.sc.gov/shoreline>). Once the lines are adopted as final, the final versions can

also be seen on the South Carolina Beachfront Jurisdiction viewer. The line coordinates are also made available on the DHEC web site in a format that allows them to be downloaded and imported into computer-generated plats by surveyors.